MORGAN STANLEY DEAN WITTER

Equity Research
Europe

June 1999

The European Internet Report

Multi-Industry Overview

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- **The number of European Internet users should triple** over the next four years to 100 million users. Investors must factor in the impact of this dramatic growth in Internet users on corporate strategies, revenues, costs, margins, profits and valuations.
- **Opportunities to invest in the potential of the European Internet are multiplying**, through established large-cap stocks and smaller 'pure' Internet stocks. The Internet also provides a threat to many business models, however.
- **In this report, we provide an in-depth look at the trends and opportunities** related to the European Internet.

This report will be downloadable from www.ms.com after 1 July. You can also find other Internet-related research reports published by MSDW on our web site.

Contents

Introduction

Over the past three years, the Internet has had a spectacular effect on the performance of US equity portfolios This has been driven by two forces: the spiralling and well-documented rise in market capitalisation of pure 'Internet plays', and the more insidious discounting of the effect on share prices of the Internet and e-commerce on business models attached to different companies and industries.

Notwithstanding the high drama of recent volatility in the US pure plays, and the fact that European equities have until recently been relatively unaffected by these considerations, we believe that....

....successful European equity investment will depend increasingly on understanding the Internet and e-commerce and how they affect companies, industries and their business models In *The European Internet Report*, we examine the growth of the Internet in a European context and identify those large-cap companies that we believe are most affected by the phenomenon. We explain how the Internet works, present our new model of Internet penetration in Europe and offer studies by relevant sector analysts on the effect of web usage on their industries.

Looking at Europe in a global context Producing this report has been a team effort, and has involved the participation of members of our analyst teams in Europe and the US, for it is only possible to understand the regional impact of the growth of the Internet in a global context. We intend to continue to provide you with global and regional insights into the Internet and e-commerce in Europe through frequent follow-up work by our sector teams, focusing on both analysis of corporate and sector trends and conceptual work on business model development.

Expanding our Internet coverage to smaller-cap, 'pure' Internet plays We are aware that the stock recommendations featured in this report relate to large capitalisation companies: we fully intend to migrate our coverage down the capitalisation curve and initiate coverage on more small- and mid-cap direct Internet plays later this year. We have included descriptions of some of these stocks in the section entitled 'A View from the Capital Markets', which also looks at some of the more prominent private market direct Internet plays.

Your feedback will help us to help you This report is aimed at different audiences, with differing levels of understanding of the technological, commercial and investment implications of the Internet. We invite your comments on our efforts and your suggestions for future areas of exploration. Contact details for all the analysts who have contributed to this report can be found below.

This report is the product of work done by many of our European analysts, led by Steve Winram of our Media team who, with MSDW colleague Michael Steib, also contributed key sections of the report. Mary Meeker and her team in the US have also added significant content and judgement. We hope that you will find their work of value in your own investment decision-making as we navigate the turbulent waters of this new e-age.

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This report has been a team effort. Steve Winram, assisted by Michael Steib, has been instrumental in pulling the report together and has written a significant portion of it. We are also grateful for the contributions of our junior analysts and research associates. The report was edited by members of our London editorial team, Richard Tourret, Adrian Shire, Annabelle Buckley and Terri Rollins, and Fred Miller and Andrew McCann in New York. Finally, thanks are due to Saira Abbasi, who has managed the formatting and administration of this document, and Sarah Beck of our production team.

Summary and Investment Conclusions

Steve Winram/Michael Steib

Why Should You Read This Report?

- **The number and market capitalisation of European Internet stocks appear set to expand rapidly** over the next few years — investors should be aware of this fast-growing medium and the scale of its impact on traditional sectors.
- **We list 11 large-cap stocks that are benefiting already or that we believe are poised to benefit from the European Internet** (see Table 1).
- **Numerous other large-cap European companies could benefit from the Internet**, based on our forecasts of their Internet revenues (see Table 2).
- **An attractive group of European.com companies is emerging rapidly**, benefiting from lessons learned in the US and the explosive growth of the Internet in Europe.
- **The Internet is changing traditional business models fundamentally**, across many sectors, creating threats as well as opportunities. Time is running out for companies that have failed to formulate an Internet strategy.
- **European Internet users seem to be at the same stage as the US three years ago** — poised for explosive growth.
- **The number of European adults using the Internet regularly should triple** to over 100 million by 2003, on our forecasts, reaching a critical mass of 35% penetration.
- **Internet penetration could increase more sharply in Europe than in the US** in its initial phase, due to improved technology, content, and easier and cheaper access.

The Internet Cannot Be Ignored

In this report, we have compiled what we believe to be the first comprehensive review of the Internet in Europe, and the first in Europe that attempts to be comprehensive in its coverage of developments across sectors and key stocks. The report explains why we think it is no longer possible to ignore or dismiss the Internet phenomenon.

Andy Grove, Chairman of Intel, said in 1999: "In five years' time, all companies will be Internet companies — or they won't be companies".

The Internet Will Transform Business

The Internet has the capacity to alter the economics of business. Internet usage can change the cost of customer acquisition, sales, marketing, distribution, inventory management and procurement. It can cause disintermediation, create opportunities for new types of intermediaries, lower and create barriers to entry, deflate prices and improve customer service levels. It will create winners and it will produce losers.

Setting up an online book store is cheaper, easier and quicker than setting up a chain of bookstores, or banks, or wine merchants. The right marketing and distribution will allow businesses to reach far larger customer bases than ever before.

Look at the business models of successful US Internet companies Some are extraordinary. priceline.com allows consumers to set prices at which they are willing to trade. eBay permits person-to-person trading on a scale and in a diversity of products never heard of before. But other models are quite ordinary. Amazon.com originated as a bookseller, Dell sells computers, and Yahoo! is a virtual offering of seemingly limitless information and resources – all supported by advertising dollars.

What they all have in common is the way they have transformed businesses through a unique competitive advantage, the Internet.

The Internet Will Gather Its Own Momentum

This is not a fad This is not something that has happened in the US but will not happen in Europe. Why? Two reasons: a competitive imperative and a revolution in functionality. From a competitive standpoint, it has become difficult already for businesses to ignore the Internet. Customers, shareholders, suppliers, investors and researchers already expect to find data, information, entertainment and transaction opportunities via the Internet.

The more users understand what the Internet can do, the more end customers want from it.

Internet Growth Should Be Dramatic

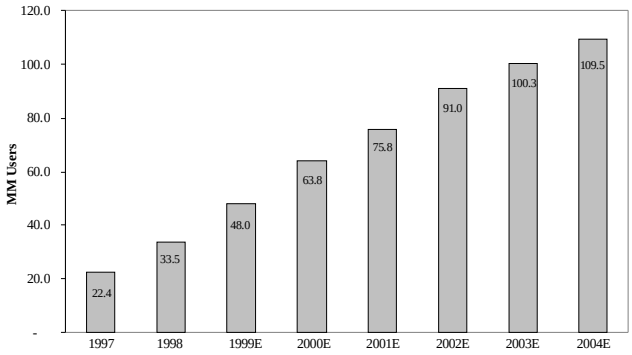
Our medium-term forecasts show dramatic growth for the Internet in Europe Currently, 34 million adults regularly access the Internet in Europe — equivalent to 12% of the adult population and around 8.9% of households (the fact adults access it at work as well as at home is one of the Internet's key features/strengths). We believe this figure will rise to 35% of adults by 2003, giving a market of over 100 million users (the IDC data in Figure 2 are even more upbeat than our forecasts in Figure 1).

We believe this target will be reached easily, not least because there are several European markets (Sweden, Finland and Norway) that have achieved 30% household penetration already. The factors that have driven adoption in these countries — high PC penetration, deregulated telecoms markets and high GDP per capita — should all apply in the larger European markets.

The mid tier of markets with medium Internet penetration rates of 8-14% of the population (Germany, the UK and Benelux) should catch up fast. Markets such as Spain, France and Italy, where penetration lags (4-5%), have also begun to see rapidly increasing interest in and growth of the Internet.

Figure 1

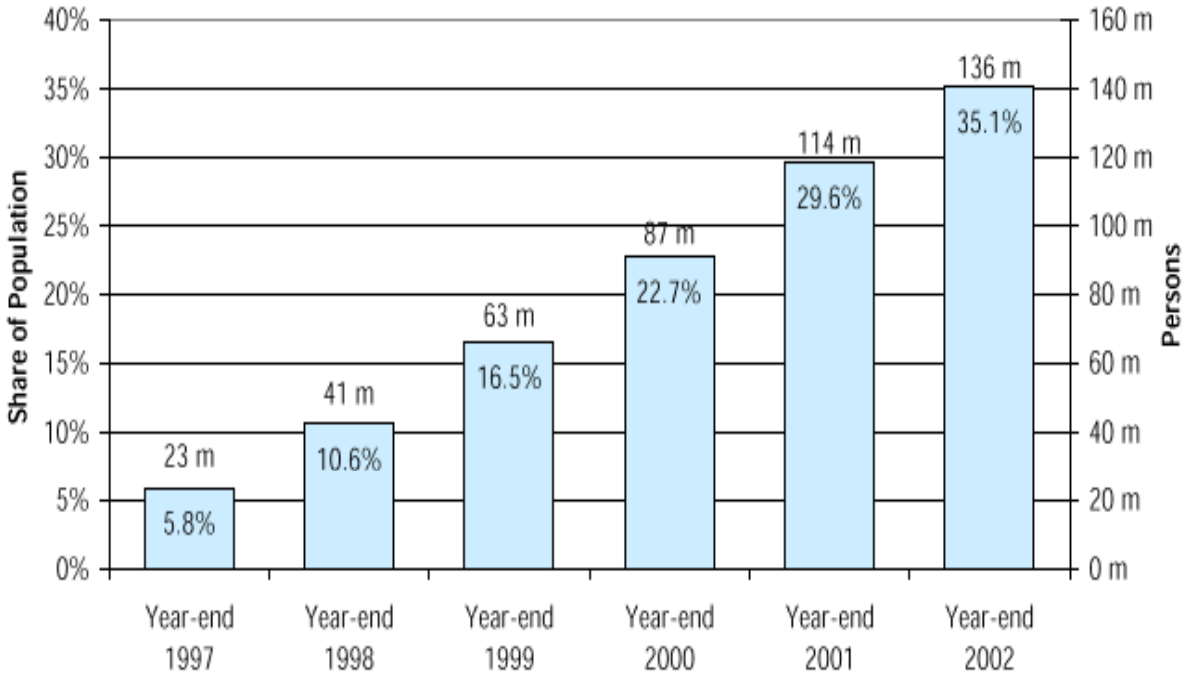
Internet Penetration in Europe - MSDW Estimates



E = Morgan Stanley Dean Witter Research Estimates

Figure 2

Web Usage Trends in Western Europe - IDC Estimates



Source: IDC December 1998

Companies and Investors Need to Position Themselves Now

Europe today is at the same stage as the US was three years ago Internet usage penetration levels are low, but have passed the 10% rate, where US investor interest in the Internet story began to take off, along with Internet company valuations.

How to Invest in the Internet in Europe

Look at the development of the personal computer industry Our US analysts saw the development of the Internet industry follow a pattern similar to that seen at the beginning of personal computers in the early 1980s, with distinct phases of growth. In the early years, the hardware/infrastructure manufacturers were the winners. However, over time, value shifted first to enabling technology (e.g., operating systems and software and services) and, ultimately, to programming and content (Figure 3).

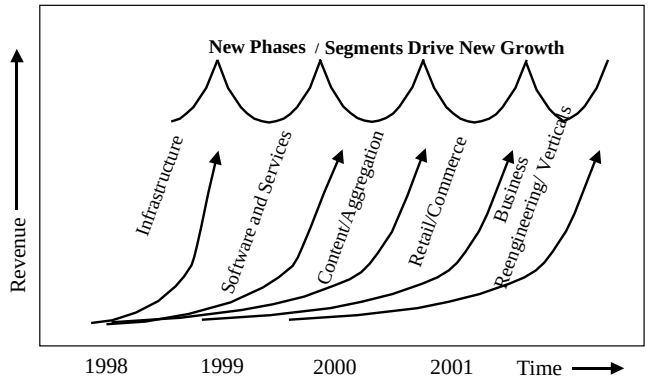
This pattern provides a template in Europe today for the Internet.

We are in the first phase, where the bulk of our stock picks relate to infrastructure providers (in the US in 1994, Cisco and Lucent were plays here) These are the telecoms companies, cable operators and equipment providers. Telecoms and cable operators offer narrowband and overtime, broadband access to each other, to multinational corporations and to consumers.

Telecoms equipment providers with expertise in broadband technology should also benefit from this growth (e.g., Alcatel). The Symbian alliance, which aims to make EPOC, the Psion operating system, the standard for the third generation of mobile communication devices, should benefit Nokia and Ericsson.

Figure 3

Internet Development Framework - Europe



Source: Morgan Stanley Dean Witter Research

The second phase of growth, in software and services (in the US in 1995, Netscape and Microsoft were plays here), is beginning to offer opportunities Established European software companies are facing a fundamental challenge from the Internet. But many of the established enterprise resource planning (ERP) companies are working hard to position themselves for the coming e-commerce wave. Companies such as SAP and Atos are our preferred plays as e-commerce enablers. Smaller specialist stocks such as Icon Medialab and a group of private companies may provide further opportunities to play growth in e-commerce.

We are also close to phase three, when providers of content on the Internet start to provide potentially explosive investment opportunities in Europe (in the US in 1996, Yahoo! and America Online were plays here) The Internet will provide new access to a massive potential international audience of 100 million people. Content will be critical in attracting and retaining audiences around the portals that act as the main roads to web content. Right now in Europe, the content plays in the leading spots are US plays such as Yahoo! and America Online though many country specific sites/companies are gaining traction in particular countries.

The fourth phase — E-commerce and retail — has jumped into conscious view because of Amazon.com and eBay We have yet to see the retail opportunities crystallise in Europe. Again, this is only a matter of time, and there are plenty of interesting examples of European retail majors (Tesco, Iceland, Dixons) and start-ups (Boxman, chateauonline) making a mark in this space.

The fifth phase, business re-engineering, is also beginning to take hold, as companies are realising slowly that the old way of doing things may be costly, inefficient or inappropriate. It may also be fatal. Here, banks, insurers, airlines and utilities, to name but a few industries, are reappraising their positions.

Looking for the European Internet Winners

Given the Internet's early phase growth in Europe, we have been keener to identify potential winners than losers, partly because fast-moving companies still have a

brief period of time to react and to exploit opportunities. However, we feel that time is running out for companies that have yet to formulate an Internet strategy. We believe this will become one of the greatest differentiators for stocks over the next few years.

Table 1 lists those stocks in our coverage universe that we believe are the best way to gain exposure to the European Internet. As noted above, the bulk of our recommendations are infrastructure plays, principally telecoms and telecoms equipment providers and cable operators, reflecting the early stage of Internet development in Europe.

However, we also highlight businesses that are actively pursuing a strategy in this area. European banks, insurers, airlines, utilities, media companies, retailers, advertising agencies and business services/logistics providers are all beginning to feel the impact of the Internet on their businesses and operations, and we have profiled those stocks that look set to capitalise on these developments, as well as a few that we believe could be affected negatively by the Internet.

How to Navigate This Report

This report is divided into two broad sections, what we call 'Internet Industry Background' and 'Internet Company Thoughts'.

The first section, following our introduction, conclusions and overview, summarises Internet penetration in Europe (and includes a section on content and usage) as well as the size and structure of the Internet in Europe It sets out penetration estimates to 2003, and the drivers of increased penetration. It touches on the major European markets and the differences between those markets, and the nature of Internet usage by individuals. More details on this and related subjects can be found in Appendix I. This is followed by a brief explanation of the infrastructure of the Internet in Europe — who owns and operates the cables, wires, switches and routers that represent the physical manifestation of the Internet. Chapters 3 and 4 look at the major Internet access or service providers and technologies at the global, pan-regional, national and regional levels.

The second section, 'Internet Company Thoughts', is focused specifically on sectors and companies It examines the impact the Internet is having on each sector, and identifies those companies that we believe are pursuing coherent strategies and that are most likely to benefit from growth of the Internet. It focuses first on several key sectors — infrastructure (telecommunications, telecommunications equipment), enterprise software and services, and content and aggregation (media) — and then commence (advertising, airlines, banks, food retailing, general retailing, insurance, logistics and utilities). The final part of this section includes a selection of recent IPOs and private companies that may provide the growth opportunities of the future, followed by a company profiles section.

The report also includes commentary or appendices on European regulatory developments, ground-breaking US research on the valuation of high-growth stocks, on major European Internet markets, Internet penetration by country, who is using the European Internet, a view of what it's like selling online, useful Web sites, Internet companies quoted on European Exchanges, an Internet glossary and terms, key data on Internet companies (with a US focus), and an Internet overview/update (also with a US focus).

Table 1

MSDW Coverage Universe: Large-Cap Companies Positioned to Benefit from the European Internet

Company	Sector	Data & Internet Revenues as a % of Sales 1998E	2003E	Comments
Infrastructure				
COLT	Telecoms	25	40	Exploits growth in demand for corporate web access, web hosting and web housing.
Energis	Telecoms	49	55	ISPs constitute one of the company's major customer groups, with 50% of their (UK) traffic carried over the Energis network.
Equant	Telecoms	98	100	Focuses on serving multinational corporations' Internet and data needs.
KPN	Telecoms	10	40	Strong domestic ISP and important joint venture with Qwest to supply pan-European backbone.
NTL	Telecoms	8	35	Early mover in UK broadband access and 49% stake in consumer ISP, Virgin Net.
Sonera	Telecoms	35	60	Advanced telecom operator that dominates consumer and business segment of the Internet market in Finland.
Telewest	Telecoms	5	35	Potential winner in race to dominate mass residential market for broadband Internet access.
Alcatel	Telecoms Equipment	10	35	Leading supplier of wireline broadband products for Internet access: ADSL technology, high capacity IP routers, ATM switches, SDH & WDM networks.
Nokia	Telecoms Equipment	7	35	Well placed for wireless Internet. World leader in mobile phones; number two in GSM infrastructure.
Software & Services				
Atos	Enterprise Software	10	25	Europe's leading e-commerce IT services provider with skills in transaction processing, outsourcing and systems integration.
Content and Aggregrators				
UPC	Media	3	23	Europe's largest broadband cable operator with 3.6m subscribers and an aggressive Internet strategy with high-speed Internet access and its portal, chello.

Source: Morgan Stanley Dean Witter Research Estimates

Table 2

MSDW Coverage Universe: Companies with Developing European Internet Businesses

Company	Sector	Data & Internet Revenues as a % of Sales 1998E	2003E	Comment
British Airways	Airlines	<1	50	Aiming for 50% of ticket sales via the net by 2003. Internet leverages customer loyalty and drastically cuts distribution costs.
Lufthansa	Airlines	<1	35	Strategy aimed at lower end of the airline ticket market, but well developed and working.
BankInter	Banks	-	-	Over 10% of BankInter's total transactions volume are executed via its 'Bknet' service.
Barclays	Banks	-	-	Leads the field in UK Internet banking and has recently launched Internet brokerage.
Merita Nordbanken	Banks	-	-	Merita has the largest Internet banking customer base in Europe at 550,000 plus 600 corporate users of its Internet site, Solo Bank
SE Banken	Banks	-	-	35% customer private payments, 20% of private equity trading and 10% of corporate customers' forex transactions through SEB are carried out over the Net.
TNT Post	Business Services/ Logistics	1	6	Potential key component of Internet-linked supply chain management with value-added web-based tracking services.
Iceland	Food Retailing	-	-	Nationwide home-order service rolled out in 1999.
Tesco	Food Retailing	-	-	Internet trials rolling out to 100 stores in 1999 and promising free ISP in the UK.
Dixons	General Retail	-	2	First-mover advantage and a huge (1.3 million) Internet customer base in the UK.
SAP	Enterprise Software & IT	0	15	Recently launched a business-to-business procurement product, online retailing and online buying community. Internet enhances product delivery.
Prudential	Insurance/Banks	-	-	Launch of Egg has generated £5 billion of deposits and 500,000 customers. Distribution cost savings for insurance products potentially huge over the Internet.
Skandia	Insurance	-	-	Steadily growing Internet-based Insurance business in domestic market.
BSkyB	Media	-	-	BSkyB's OPEN platform has compelling content and potential for further Internet integration.
Canal+	Media	-	-	Now offering broadband Internet access via Numericable with partner Vivendi.
Carlton	Media	-	-	A suite of websites complement its specialist digital channels.
EMAP	Media	0	8	Portfolio of content plus strong travel based websites and transaction orientation.
Modern Times Gp.	Media	0	3	Operates a portal site *www.tele2.se* and provides a range of web-based shopping sites.
Mondadori	Media	0	2	Websites and joint venture with Bertelsmann for online books in Italy.
Pearson	Media	-	-	Company aims to make FT.com the leading business portal on the web.
Reuters	Media	<1	20	Strong position as wholesaler of information to ISPs.
Schibsted	Media	5	7	Multimedia division operates Scandinavia Online.
SES Astra	Media	-	-	Developing ASTRA-NET, a multimedia platform for high-speed data delivery.
United News & Media	Media	2	10	Aiming to capitalise on Internet sites of CMPNet and Miller Freeman in business publishing.
Wolters Kluwer	Media	5	30	Online/electronic products are Wolters Kluwer's fastest-growing segment (+30% last year) and account for 18% of revenues.
WPP	Media	2	10	Benefits from greater media complexity and through specialist communications e.g., direct marketing.
British Telecom	Telecoms	14	30	BT has one of the few major European investment programmes aimed at domestic and pan-European Internet strategies.
Ericsson	Telecoms Equipment	5	35	Well placed for wireless Internet: world leader in wireless infrastructure equipment; a leader in third generation; number two in digital mobile handsets.
Vivendi	Utilities	-	-	Strong combination of content (Canal +) and distribution (Cegetel) plus 50% of AOL/Bertelsmann in France.

Source: Morgan Stanley Dean Witter Research Estimates

A US View on The European Internet

Mary Meeker & the US Internet Research Team

From the Eye of the US Internet Storm…What's the Forecast for the European Internet Storm?

Let's Take a Step Back in Internet Time…

It's been nearly four years since the Netscape IPO (8/8/95) rocked the world (and the US capital markets) and helped launch venture capital-backed, entrepreneurial, Gen-X'd, Internet life. It's been just shy of three years (10/96) since it looked to many that America Online was toast. Rarely has so much happened and been created so quickly.

While Internet growth has truly been a global thing (of the 100 million Internet users in the world today, 35% reside outside the US), most markets lag 1-4 years behind the US in terms of market penetration and evolution of content and services. Why? When Netscape unleashed its Web browser and its IPO in the Summer of 1995, US PC penetration was already high, allowing for an easy upgrade to the Web. America Online's online service had good mind share in America, and the stock market was pumping, allowing for attractive financing opportunities for hot companies. What's more, telecommunications costs were, on a global basis, relatively low, the regulatory environment remained liberal, and the Web, Silicon Valley, Bill Gates, and Marc Andreessen got buzz.

We Love Pattern Recognition…

We consider ourselves reasonably well-educated students of technology IPOs, and one of the things that has been interesting about the evolution of US Internet IPOs is that each year, since 1994, there has been a new Internet IPO/concept that has captured imaginations and users and has created wealth.

In 1994, **Internet Infrastructure** ramped with the IPO of UUNet and the reincarnation of Cisco as the provider of Internet plumbing. In 1995, **Internet Software and Services** ramped with the IPO of Netscape and the reincarnation of Microsoft as an Internet company. In 1996, **Internet Content and Aggregation** ramped with the IPO of Yahoo! and the reincarnation of America Online as an Internet company. In 1997, **eCommerce** ramped with the IPO of Amazon.com. In 1998, **Business Re-Engineering** ramped with the IPO of eBay. In 1999, the big theme is **Business-to-Business eCommerce** (note the IPO of Healtheon). The wealth created by the aforementioned companies (in terms of market capitalisation change) since the Netscape IPO, as of 6/10/99, exceeded $800 billion.

So…what have been some rules of success for these big Internet market capitalisation winners?

- Huge Market Opportunities
- Good Technology/Service that Offers a Significant Value/Service Proposition to Its Customers
- Great Management Team/Board of Directors/Committed Partners
- Leading/Sustainable Market Position with First-Mover Advantage. Potential for Brand Leadership
- Insane Customer Focus
- Extensible Product Line(s)
- Annuity-Like Business with Sustainable Operating Leverage Assisted by Barriers to Entry
- Strong Business Momentum

So…what does this mean for those looking for Internet investment opportunities in Europe?

1) **Internet Infrastructure** (telecommunications-related) investments may likely be the biggest money makers – simply put, Internet usage is growing, and the local players that gear for data growth should excel.

2) **Internet Software and Service** investing will be tricky, because so much of the Internet software plumbing is being created by such industry standard-bearers as Microsoft, Netscape, Oracle and a host of US-based start-ups, though European companies, such as SAP, with large installed bases and emerging local Internet consultants have compelling opportunities.

3) **Internet Content and Aggregation** is a scale business, and companies such as Yahoo!, AOL, Microsoft…well, they have scale. That said, it's highly likely that thanks, in part, to language and cultural differences in many European countries, leading vertical portals should continue to excel in their markets, and we expect market consolidation here.

4) **eCommerce**…again, here, it's a scale business, and companies such as Amazon.com and eBay have impressive reach. But because eCommerce has kicked in later than some other Internet business segments, and because a host of European experts (including traditional companies), on a relative basis, have been early to focus on eCommerce, there should be some compelling European investments in this area.

5) **Business Re-Engineering** and **Business-to-Business eCommerce**…given their early stage of evolution, these markets can still be considered wild cards, though the Spring Training roster of US companies in these sectors looks strong.

Overview of the European Internet: *Internet Forecasts* and *Internet Structure*

Steve Winram/Michael Steib

Investment Summary

- **The number of European adults using the Internet regularly should triple** to over 100 million by 2003.
- **New technologies will drive demand for Internet services**, with easier and faster access and improved content.
- **Supply-side constraints should loosen** as several European carriers add new capacity to the backbone.
- **We believe the free access model will be very important in attracting new users** to the Internet in Europe. The early ramp in the UK is impressive…
- **Europe should benefit from being at an earlier stage in the Internet growth cycle**, by learning from the US experience and adopting the latest technology.

How Big Will the Internet Be in Europe?

The number of European adults using the Internet regularly should triple to over 100 million by 2003, on our forecasts. Internet development is at an earlier stage in Europe than in the US. Forecasts for the number of households connected to the Internet rise from an estimated 8.9% currently to over 30% by 2002, implying penetration of more than 37 million homes. We believe that this is an inappropriate measure, however, since 40% of Europeans access the Internet at work, and 28% via an educational institution. Approximately 30% of adults access the Internet in more than one location.

The appropriate measure, in our view, is access by individuals. We estimate that 34 million European adults regularly access the Internet currently, some 11-12% of the total adult population. We expect this number to double by the year 2000 and for penetration to rise to 35% by 2003. This would mean a market of more than 100 million users.

Demand Driven by New Technology....

We believe that demand for Internet services will increase in line with the ease and speed of access to the Net and the quality of content. Our view is that demand for Internet services will be driven by the following factors.

- A virtuous circle is being created where higher Internet speeds permit new applications that drive demand for bandwidth and result in further infrastructure upgrades. Content will continue to improve as users demand more cool stuff like music downloads, community, instant messaging, and more personalization. Video and audio on the Internet will become commonplace, as well as bandwidth-heavy applications such as music downloading. Demand will be driven by increasing access speeds, pervasive use in the workplace, free access for the consumer, and by positive demographics (high adoption rates amongst the young).
- **A revolution in speed of access** Major advances in access speed over today's 14-56 kbps dial-up modems are available already to Internet users via ISDN. Digital Subscriber Line (DSL) technologies can provide high-speed access over standard telephone lines, and, in time, cable modems and wireless technologies add a new dimension of high-speed access that will further enhance the attractiveness of the medium.

....and Free Access

ISP business models are moving to 'free' access for the European consumer Freeserve and Virgin in the UK (among many others), Mannesmann with Yahoo! in Germany and World Online with TF1 in France have all launched free access business models. The viability and sustainability of the free access model is one of the most hotly debated areas of Internet commerce in Europe. However, we believe it will be hugely important in getting consumers to test and adopt the new medium, and free access seems to us to be a major step towards attracting large numbers of subscribers.

Traditional Media Are Broadening the Internet Audience

The new digital television operators are tentatively offering e-mail services through the set-top box used to decode digital TV signals. Functionality is limited to e-mail at the moment, but we believe that, in the longer term, the television companies will not turn their backs on such a compelling medium. People already use TV to get information: in the UK, over 20 million adults use the Teletext on-screen information services every week, out of 28.2 million adults (61% of the total) who have Teletext services on their televisions.

In the UK, we have seen two mass-market newspaper publishers — the *Sun* and the *Mirror* — launch free-access Internet services. These launches have been accompanied by offers of deals on Internet-connected home PCs from brand-name manufacturers.

The Demographics – The Young Think the Net Rocks

Surveys of European demographic usage of the Internet show that 50% of 15- to 19-year-olds regularly access the Internet. Although this is a 'slow burn' model for Internet penetration and usage, we believe experience with other new technologies in the past shows that this is a compelling argument for the medium's potential to achieve saturation penetration as today's teenagers become tomorrow's parents and workers.

The PC Presence Is Still Increasing

The PC will remain the dominant means of accessing the Internet for the foreseeable future, we believe. PC penetration of households is forecast to reach almost 50% of European homes by the year 2004. In fact, consumers' desire to access the Internet is becoming a key driver for PC sales in Europe. PC sales grew by 20% in the first quarter of 1999 versus 1998. This is complemented by penetration of PC and Internet technology in the workplace. The number of employees with Internet access at the workplace is forecast to grow from 29 million (28% of white-collar workers) to 77 million (70%) by 2004.

Web Content – Something for Everyone

The value of content should not be underestimated as a driver of the market. The Internet can be likened to vast databases of information, with something of relevance to everyone. We believe it will become perceived as a competitive advantage for businesses and individuals to have access, in terms of both the information available and the range and price of products in markets that clear or operate electronically.

Business Penetration Growing

Surveys of European businesses show that 28% of companies have some form of Internet access. Penetration rates are skewed to larger corporations (defined as having 500 or more employees), where on-site Internet access rises to 67%. This does not mean that all employees have access, nor does it quantify restrictions on access imposed by corporate firewalls. However, the growth of virtual private networks, Intranet access and wide area networks emphasises the importance to companies of deeper Internet access within their organisations.

Nascent Markets, Battlegrounds Developing

Europe is a growth market in terms of Internet penetration, which is in its immature phase. Nearly all the major areas of Internet commerce — telecommunications services, telecommunications equipment, provision of backbone infrastructure, Internet access, content or portal sites and all areas of commercial activity — will see jockeying for market position. We also believe there will be significant consolidation over the next 18 months, as companies attempt to secure a position in the leading pack that will be the ultimate winners from this growth market.

Infrastructure Issues for European Internet Growth

Regional European Backbone Dominated by PTTs

The Internet infrastructure in each European country is dominated largely by the incumbent public telephone carriers (PTTs). This applies both at the backbone infrastructure level and in terms of the 'last mile' or local loop, the connection with the domestic consumer. This is important for two reasons: the way in which PTTs influence the structuring of charges for online access, and their influence over access technologies. European telecoms pricing is based on time usage, whereas the US model uses fixed-rate local calls.

Local loop access is predominantly over copper pairs, and access speeds at the local loop are slow, because the PTTs

have generally not invested aggressively in new access technologies.

Global Backbone Still Cartelised by Major US Players

The European Internet infrastructure relies on links with major global backbone suppliers. Most Internet traffic is routed through US networks, causing constraints and bottlenecks between the US and Europe. The major backbone networks (WorldCom/UUnet, Sprint, Cable & Wireless) now dominate global traffic, and private peer arrangements between these big three have displaced traffic exchanges at Internet Exchange Points (IXPs), with the result that IXPs will become less and less important, in our view.

Most European IP backbones have far less bandwidth available than their US counterparts. Some providers have routes as 'thin' as 2 Mbps (million bits per second), while, in the US, the equivalent capacity is 622 Mbps and growing. The cost of links across Europe is excessively high, with the PTTs and other former monopolies charging high prices, which causes country-to-country bottlenecks.

European Network Access Points (NAPs) suffer massive undercapacity compared with US NAPs. Even large European NAPs with 155 Mbps capacity have around only 10% of the capacity of large US NAPs.

These Supply-Side Constraints Will Loosen

Several European new carriers are increasing the supply of European backbone. UPC, Qwest, Level3, Carrier1, BT/AT&T, Viatel, C&W and Global Crossing, among others, represent the new generation of carriers, and are all working to develop European high-speed networks.

Current Infrastructure Issues Are Addressable

Most of the infrastructure issues can be dealt with through competition and technology. To some degree, Europe's technology gap is an advantage, as the adoption of later digital technologies will avoid some of the early difficulties experienced in the US with slower, analogue devices. Indeed, the fact that Europe is at an earlier stage in the growth cycle is the main opportunity.

Differences in Internet Usage Between Countries

Europe is far from being a homogeneous market. It divides neatly into three tiers, with the greatest penetration in the Scandinavian markets. There is scope, however, for the middle-tier countries (Germany, the UK and the Benelux countries) and the even less developed markets (France, Spain and Italy) to catch up.

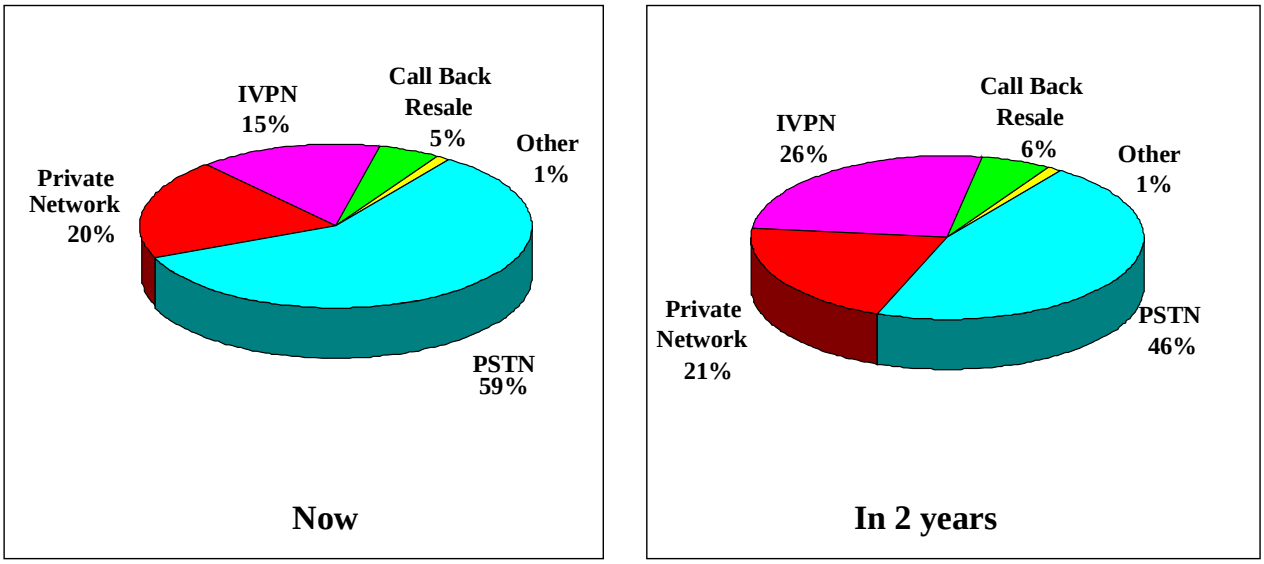
Local Language and Locally-Sourced Content Is Critical

The only non-technological obstacle to Internet adoption is cultural and linguistic resistance. We believe that web content will become increasingly multilingual, with 'local language plus English' options. For example, Yahoo! provides its offering in French, German, Italian, Norwegian, Danish, Spanish and Italian as well as English. The trend is towards provision in local languages of content that is sourced locally and not simply translated.

European Corporations and the Internet

Figure 1

How Is Your International Voice Traffic Carried?

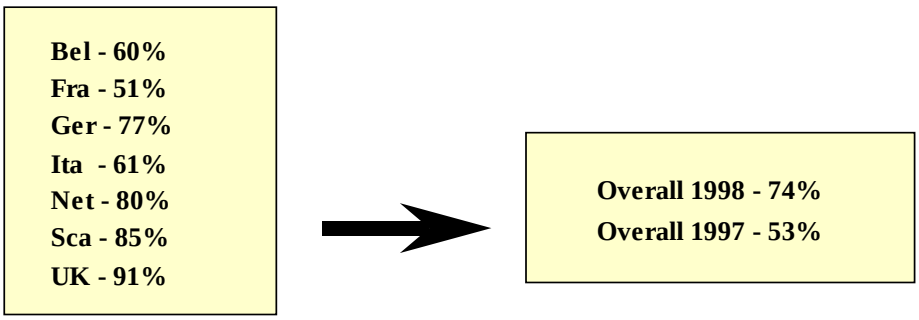


Source: Yankee Group European Large Enterprise Survey 1998

Figure 2

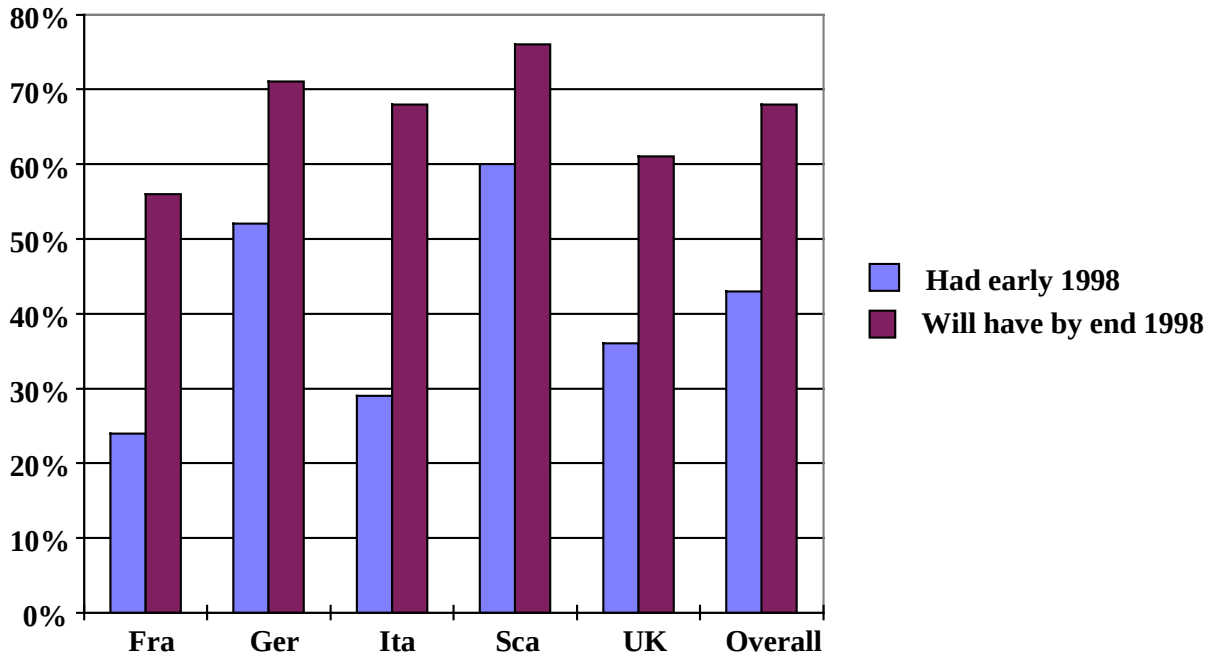
IP Popularity in Corporate Networks

% of Companies that have IP as their Main LAN protocol



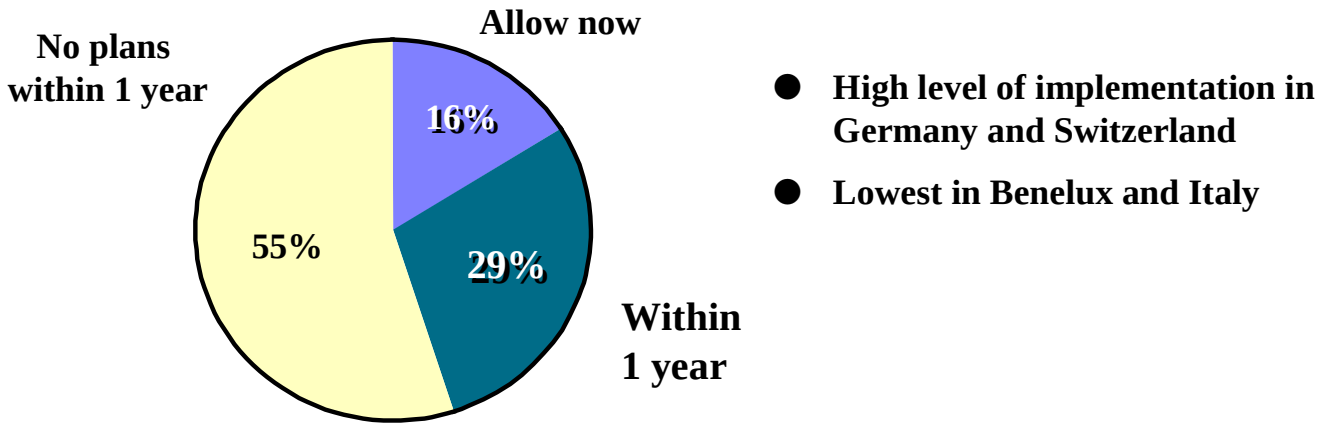
Source: IDC European Telecoms Manager Survey, 500 Large Enterprises 1998

Figure 3
Intranet Implementation Plans



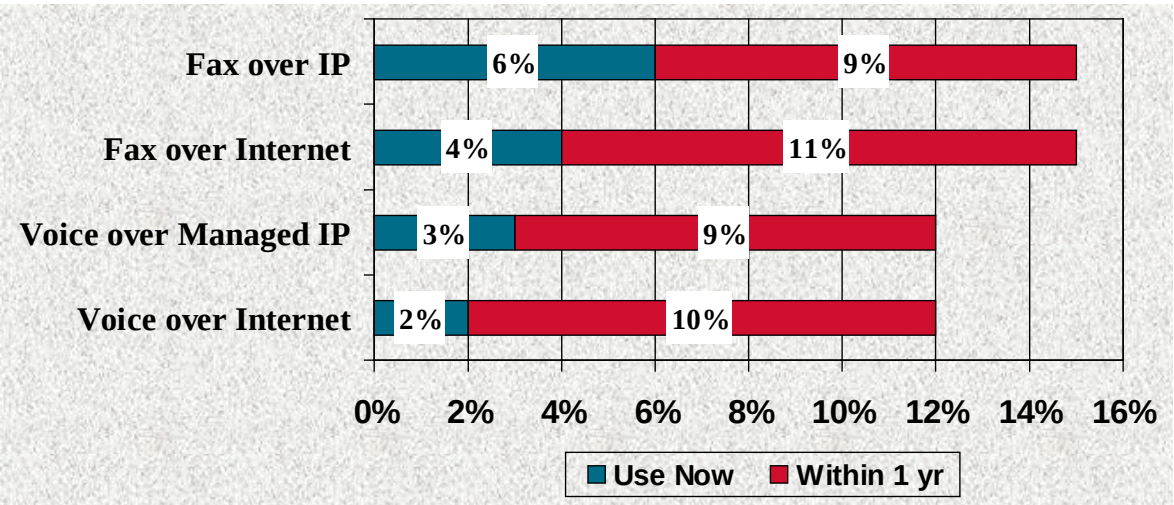
Source: IDC European Telecoms Manager Survey
500 Large Enterprises 1998

Figure 4
Extranet Intentions



Source: IDC European Telecoms Manager Survey, 500 Large Enterprises 1998

Figure 5
Use/Planned Use of Voice and Fax over IP/Internet



Source: IDC European Telecoms Managers Survey 1999, 653 companies with more than 100 employees

Figure 6
Use and Planned Use of Corporate Internet Applications by Large & Medium Enterprises

	1999	2000
E-mail	94%	97%
Customer Service	25%	42%
Fax	10%	24%
Selling via Web	26%	38%
Buying via Web*	19%	36%
Voice	3%	16%

(*business to business I-Commerce process e.g. web based EDI)

Source: IDC European Telecoms Manager Survey 1999,
653 companies with more than 100 employees

The European Internet Report — Chapter Summaries

Like *The Internet Report* and our subsequent special publications on the Internet, this document is big. Thus, we offer the following summary points from each chapter of this report.

Internet Industry Background

Chapter 1: Internet Penetration in Europe

- **The number of adult Internet users in Europe should increase by almost 200%**, from 34 million in 1998 to 100 million in 2003, according to our new model of European Internet penetration.
- **Digital technology, higher access speeds, 'free' access and improved content could all drive early European adoption**, at a rate faster than that seen in the US.
- **30% penetration rates in Europe are achievable**, in our view — Nordic rates are this high already.
- **We expect dialling up from home to remain the most popular method of connecting with the Internet**, although cable modem and mobile will account for an increasing share of users, on our forecasts. We look for around 4 million broadband users in Europe in 2002.
- **Around 12% of European adults (34 million people) use the Internet**, compared with about 32% (64 million) in the US, on consensus estimates for 1998.

Internet Penetration in Europe, 1998

	Internet Users (m)	Total Population (m)	Proportion of Population[1] (%)
Austria	0.54	8.1	6.7
Belgium	0.79	10.2	7.7
Denmark	0.95	5.3	18.0
Finland	**1.57**	**5.1**	**30.8**
France	2.79	58.6	4.8
Germany	7.14	82.1	8.7
Greece	0.24	10.5	2.3
Ireland	0.26	3.7	7.1
Italy	2.14	57.6	3.7
Netherlands	1.96	15.3	12.8
Norway	**1.34**	**4.4**	**30.5**
Portugal	0.26	10.0	2.6
Spain	1.98	39.3	5.0
Sweden	**2.58**	**8.8**	**29.3**
Switzerland	1.00	7.1	14.1
UK	8.10	58.1	13.9
Europe	**33.6**	**384.2**	**8.8**

1. Based on the total population, including children
Source: Computer Industry Almanac

Chapter 2: European Internet Infrastructure

- **Telecoms operators, alternative network operators and other Internet Service Providers (ISPs) own and manage the Internet** infrastructure in Europe.
- **We estimate there are over 2,000 ISPs in Europe**, including international backbone ISPs, national ISPs and regional and consumer ISPs.
- **European ISP revenues are forecast to grow at a CAGR of 30% to 2004**, when they could reach $22 billion.
- **Backbone services revenues could more than triple to $6.1 billion in 2002**, compared with $2.0 billion in 1998, according to Datamonitor.
- **European backbone infrastructure is under-developed at present** A group of new network operators (alternative network operators, to distinguish them from the PTTs) are rapidly building new high-speed/broadband capacity. This group, together with the PTTs, stands to be a major beneficiary of growth in data and Internet traffic.
- **Competition to supply corporate Internet users is well developed,** but access to the consumer, via the local loop, is still dominated by the PTTs.

Chapter 3: Access Providers and Portals

- **Internet service provision is commoditising quickly at the consumer access level** Access providers to corporations can add value through managed network services: e.g., web-hosting, virtual private networks and transaction software.
- **We expect consolidation to identify the likely winners** over the next 18 months out of the 2,000-plus ISPs currently operating in Europe.
- **Dixons' Freeserve and other free ISPs have shown that one revenue stream (subscriptions) can be sacrificed** in order to achieve much larger revenue streams from advertising and commerce.
- **Successful ISPs will own a combination of compelling content and a high number of subscribers/customers** in order to capitalise on other sources of revenue.
- **The most successful access service models will combine revenues** from telecoms, subscriptions, advertising and transactions, in our view.
- **The winners in this sector should emerge from five groups:** the PTTs, cable companies, media groups, non-typical Internet companies and US content and aggregation companies.

Chapter 4: Internet Access Technologies in Europe

- **Access technologies will be a key driver of Internet penetration**, improving the access to and functionality of the medium.
- **Dial-up remains the most widely-used narrowband technology**, most typically by individuals and small businesses.
- **xDSL technology is being perceived increasingly as a good compromise** between the slow speed of dial-up services and the high cost of cable network upgrade.
- **Cable modems provide access to the Internet up to 1,000 times faster than dial-up services** Also, the customer saves telephone usage charges, so cable access may also be cheaper for frequent users.
- **Mobile access is one area where the market could develop more rapidly in Europe** than in the US, as Europe's cellular operators have adopted the pan-European GSM for cellular digital communications.
- **Internet access is likely to see significant changes over the next 2-3 years** as broadband technologies are rolled out to the mass market, creating opportunities for entertainment and information-rich media and commerce.

Internet Company Thoughts

Chapter 5: Key European Players by Sector: Introduction

- **The European market is at an early stage of its development**, and we expect infrastructure companies — telecoms companies, alternative network service providers and cable operators — to be the early winners and main beneficiaries of almost $30 billion of annual incremental data and Internet revenues that should be generated over the next few years.

- **A battle royal is developing in the consumer Internet Service Provider market**, with four main groups jockeying for position as primary providers of access and content: telecoms companies, cable operators, media groups and 'non-typical' players such as Dixons. We expect a process of rapid consolidation in this market.
- **Retail and e-commerce operators are now beginning to establish operations**, and we expect to see a broad range of players, from major companies to new start-ups.
- **We look for companies with a coherent Internet strategy that are well placed to benefit from one of the three business models** — recurring or subscription revenues, advertising or e-commerce.
- **We also look for companies that will benefit from business re-engineering** that the Internet may bring about — for example, rapidly falling distribution costs (banks, insurance) or disintermediation (e.g., airlines / travel agents / publishers).
- **The Internet should gain 5% of the European advertising market on our forecasts**, creating a $5.9 billion market by 2004, making it the fastest-growing medium in Europe.

Chapter 6: Telecommunications: The Way to Play the Internet in Europe

- **The European telecoms sector is one of the best ways to gain exposure to European Internet growth**.
- **Telecom operators are one of the few groups actually generating compelling revenue levels** from the Internet.
- **The Internet could account for 30-40% of PTOs' revenues in five years time**, up from 8-10% now.
- **Of the new entrants to the sector, we highlight COLT, EQUANT, Energis, NTL and Telewest** as being the best Internet plays, in our opinion.
- **Of the PTOs, we would pick Sonera and KPN, as well as BT.**

Chapter 7: Telecommunications Equipment: Building the Internet

- **All five principal telecom equipment suppliers in Europe should benefit from the Internet phenomenon**: Alcatel, Siemens and GEC primarily on the wireline side, and Ericsson and Nokia primarily on the wireless side. However, Internet growth will doubtless increase the degree of competition from US and Japanese suppliers.
- **Wireline business should be a more significant opportunity than wireless business**, at least in the short and medium term. We would highlight **Alcatel** as being likely to be the prime European beneficiary of the wireline opportunity, and **Ericsson** and **Nokia** the prime beneficiaries of the potential wireless Internet business.
- **The Internet is a widely distributed client/server computer architecture** which is connected, for the most part, via the telecom network. 'Building the Internet' therefore means expanding, enhancing and developing the telecom network. This is already the dominant focus for the telecom equipment companies.

Chapter 8: Enterprise Software & IT Services

- **Many established software companies are facing a fundamental challenge from the Internet** Investment spending has shifted toward supplier- and customer-focused applications built on web architectures, and away from finance, human resources, and manufacturing — the mainstay of the traditional ERP (enterprise resource planning) players.

- **Many traditional software companies have been slow to position themselves** for these new opportunities, but their size and market share should enable some of them to take back the lead.
- **The door has opened for new entrants to claw their way in**, however. It is possible that a new set of leaders will emerge. New entrants can bring their product faster to market than the longer-established companies, and they can offer functionality for new business processes.
- **Like the software companies, IT services companies must navigate a deep, technology-induced chasm** between the old skills and the new.
- **Both software and services companies are running hard** to position themselves for a coming e-commerce wave. We highlight **Atos** and **SAP**.

Chapter 9: Logistics & Business Services: Travelling into a New Era

- **E-commerce, driven by the Internet, is going to affect all aspects of the European logistics business**, posing both opportunities and threats.
- **The importance of supply-chain management is likely to increase** dramatically in a build-to-order world.
- **Additional distribution and mail volumes should be generated** by retail purchasing over the Internet.
- **Companies will increasingly look for regional or global logistics solutions** as the Internet leads to greater pricing transparency and outsourcing of non-core activities.
- **Poor Internet capability is likely to be a significant competitive disadvantage** in this sector, and some distributors could find themselves cut out of the supply chain.
- **We highlight TPG as a likely key beneficiary of the Internet**, as it offers a unique combination of services in Europe that utilise the Internet.

Chapter 10: Media: Content to Transact

- **European media companies' Internet activities have gone three different routes** Some have gone the route of forming ISPs (UPC, United, Mirror and NewsCorp), and others have chosen to leverage their content (EMAP, Wolters Kluwer, Mondadori, Pearson, Reuters and Carlton) either directly on their own websites or in partnership with other players. In some cases (Reed Elsevier, Thomson and BSkyB), companies own and operate closed electronic platforms which they are gradually upgrading to be more Internet compatible.
- **Picking the winners from this group is difficult** Given the stage of the Internet market's development, there are few companies for whom the Internet is a dominant or even meaningful revenue source currently. We expect this to change rapidly though.
- **UPC, the European cable operator, is our favoured pick from the media sector** It offers high-speed broadband access and compelling content through its Internet portal, Chello.
- **Reuters and Wolter Kluwer are also making Internet plays** Reuters is in a relatively strong position as a wholesaler of news and information to ISPs, and Internet technology enhances its existing product delivery. Wolters Kluwer derives some 18% of its revenues from electronic and online activities and has well-established Internet products.

- **We also like magazine publishers** for their ability to leverage content and communities of interest and generate advertising and transaction-based revenue streams. **United News & Media**, **Mondadori** and **EMAP** are worth watching, in our view, and **Pearson** has a powerful weapon in FT.com.

Chapter 11: Advertising: Internet — Fastest-Growing Medium Ever

- **The potential of the Internet as an advertising medium is enormous**, given the explosive growth in Internet usage, the greater targeting and tracking potential of Internet advertising, and the availability of the Internet at work as well as in the home.
- **The Internet may be the ultimate one-to-one marketing tool,** allowing companies to target and deliver directed messages to an audience with specific demographics and interests.
- **The Internet also provides the first medium where advertising can be directly converted to transactions**, as advertisements become point-of-sale opportunities.
- **The Internet, like other new media before it, will need to reach critical mass** in terms of penetration of the market (i.e. among all individuals), which we believe occurs at 35%+ penetration.
- **In the US, we are conservatively predicting advertising on the Internet will approach 13% of the total advert market by 2002**, which should be worth $25 billion per annum.
- **In Europe, we assume Internet advertising will take approximately 5% of the total market by 2004**, which should be worth $5.5 billion.
- **This pie will not be shared equally —** as has happened in the US, European Internet advertising revenues will likely concentrate among the leading Web properties.
- **Media carrying classified are most likely to lose revenue to the Internet in the medium term**, followed by consumer and business magazines.
- **We would expect a migration of advertising spending to the Internet** from both printed and broadcast media in the longer term, as the latest round of technological upgrades, especially broadband-related technologies, will begin to give the Internet TV-like qualities.
- **Internet advertising appears to be a medium to rival commercial radio in terms of market share** However, we believe Internet advertising will achieve this status in a period far shorter than the 25 years it has taken radio to get to 5% of display advertising and 3% of the total market.
- **We continue to favour WPP as the principal European advertising play** For advertising agencies, any increase in the complexity of media generally reinforces their function and value to clients as an intermediary.

Chapter 12: Airlines: Gear Up for Internet Take-Off

- **The online travel business is one of the largest and fastest-growing Internet trading areas.** The Internet has helped the supply of travel information and the conduct of transactions.
- **Each airline will need to define its Internet strategy**, in our view. Competitive positioning will be crucial in order to capture opportunities and withstand threats.

- **Internet bookings could account for 25-50% of average revenues in five years time, compared with** less than 1% for most European airlines currently.
- **We highlight British Airways and Lufthansa as two airlines with clear Internet strategies** BA aims to generate 50% of its sales via the Internet in 2003.

Chapter 13: European Banking: Moving towards the Net

- **The volume of internet banking has increased rapidly in Europe** in terms of number of services and customer numbers, albeit from a very low base.
- **Future growth may be constrained** by the inability to provide financial advice over the Internet.
- **The Internet can be a much cheaper distribution channel** for commoditised products than the old branch network.
- **Established banks have brands, products and infrastructure**, which should make it more difficult for new entrants.
- **Our key Internet plays include Bankinter, MeritaNordbanken, SEB and Barclays**, all of which have developed significant Internet banking businesses.

Chapter 14: Food Retailing (UK)

- **UK food retailers appear better placed to sell via the Internet than their continental peers**, given their relatively deep pockets and their existing IT know-how and systems.
- **No home ordering system has yet been designed that satisfies both sides of the retail equation**, the shopper and the retailer, however.
- **The perceived threat to UK superstore retailing posed by home ordering seems exaggerated** Demand is likely to take time to flourish, and is likely to remain confined to an upmarket, urban niche, at least for a while. J. Sainsbury has just curtailed trials of its Orderline service outside London, on grounds of insufficient demand.
- **Retailing via the Internet will still be retailing** Retailing attributes including a one-stop range, buying scale, customer service and ease of use will be needed to do it well.
- **Tesco and Iceland are the two most interesting Internet food retailing stocks**, in our view. In particular, Tesco plans to exploit the synergies between its Clubcard, its new ISP and its home ordering service, Tesco Direct.

Chapter 15: General Retailing: The Internet — The Next Revolution?

- **The Internet has become a key factor in valuing general retail stocks** in the UK recently, and has had a major impact on relative stock performance.
- **There is a danger of indiscriminate re-rating due to Internet exposure in the UK retail sector** Applying high valuations to any retailer that announces an Internet strategy seems unwise.
- **Barriers to entry seem low, but initial marketing expenses and the cost of creating distribution infrastructure can be high** Serious players will have to be prepared to carry the start-up costs.

- **Selling a service can be easier than selling goods** Several UK retailers have chosen to leverage their large customer bases and well-known brand names to offer their customers access to the Internet itself.
- **Our overriding conclusion about the Internet is that first-mover advantage really does matter** Being first and being number one is the key to successful retailing on the Net.
- **Dixons is our preferred Internet play**, because of the first-mover advantage it has secured with the success of Freeserve and because of its overall Internet strategy.

Chapter 16: Insurance: A Revolution Waiting to Happen?

- **The complexity of many insurance products means the Internet is not a natural distribution channel** for them, and it has been slow to have an impact on the industry in the US and Europe.
- **But the Internet could have a significant longer-term effect on the industry**, as a distribution channel and a servicing tool.
- **The Internet should enable insurers to bypass costly traditional distribution channels** and so reduce their cost bases.
- **The impact is likely to be greater in personal lines and non-life**, and less in industrial lines and life (except for simple coverage such as term assurance).
- **Incumbents will be forced increasingly to complement existing sales channels with the Internet** in order to compete with low-cost providers and brokers.
- **The winners will be those providers that realise the potential of the Internet early**, building a reputation for Internet delivery and servicing, and winning over technologically-literate customers.
- **Prudential and Skandia are our two key internet plays** in the insurance sector.

Chapter 17: Utilities: Suppliers, Not Users

- **Most European utilities are exposed to the development of Internet** either through capturing data volume traffic on their Telecom transmission network or through their own ISP.
- **Utilities with large ISPs include Energis with Plant Online, ScottishPower with Demon, and Vivendi with AOL/CSI France.**
- **The Internet could also be another useful marketing channel for utility sales**, although pricing is usually the key factor for customers. We include a case study on the UK.
- **Power lines themselves could be used to send voice and data transmissions**, which could enable a fundamental expansion of Internet functionality. Utilities such as RWE and Sydkraft are currently testing such technology.
- **We highlight Vivendi as having one of the most developed Internet strategies** in our utilities universe.

Chapter 18: A View from the Capital Markets

- **Europe does not yet have an established universe of public Internet companies comparable to the US.**
- **The shortage of quoted European pure Internet stocks** appears to lead investors to buy into other companies with Internet operations that act as Internet 'proxies'.
- **In the US, entrepreneurial companies funded by venture capitalists led the emergence of the Internet in the public equity markets.** More recently there has been an increasing prevalence of established corporations seeking to unlock value in Internet-oriented assets through subsidiary IPOs and Letter Stock offerings.
- **In the European context the growth of Internet offerings appears to be more balanced** with both traditional corporations and entrepreneurs seeking to raise public capital.
- **It is likely that the Internet new issue market will advance more readily as a result of the substantial US investor base seeking technology opportunities globally** Equant, for instance, pursued a dual listing strategy to attract capital from both sides of the Atlantic
- **Some European stock exchanges are focusing on high-growth sectors such as the Internet**, notably the Neuer Markt, Euro.NM and EASDAQ.
- **European Internet IPOs have generally performed very well**, although not as spectacularly as their US brethren.
- **A significant source of new European Internet stocks will be from spin-offs and sub-IPOs**, in the medium term, in our view. This compares with the US, where start-ups are clearly the dominant stocks.

Chapter 19: Selected European Internet Company Profiles

- **This section includes basic information on selected European Web sites that have compelling momentum** We have included private European based Internet companies, as well as some of the more interesting traditional companies (see our *Internet Company Handbook*, June 1999, in which we profiled the leading public U.S. Internet companies). Note that many are companies profiled elsewhere in this report.

- Our choices hinged on a number of factors, including: extensible and innovative business model; leading technology; ramping user base and strong business momentum; value added service; first mover advantage; market opportunity; compelling value proposition to consumers and suppliers; impactful strategic partnerships.

- For each of the 52 companies, we include a basic company description, the country of the headquarters, the URL, and screen shots from the Web site. This section is meant to be a rudimentary one-stop shop for understanding the basics of today's European Internet frontier.

Chapter 1

Internet Forecasts

Internet Penetration in Europe

Steve Winram/Michael Steib

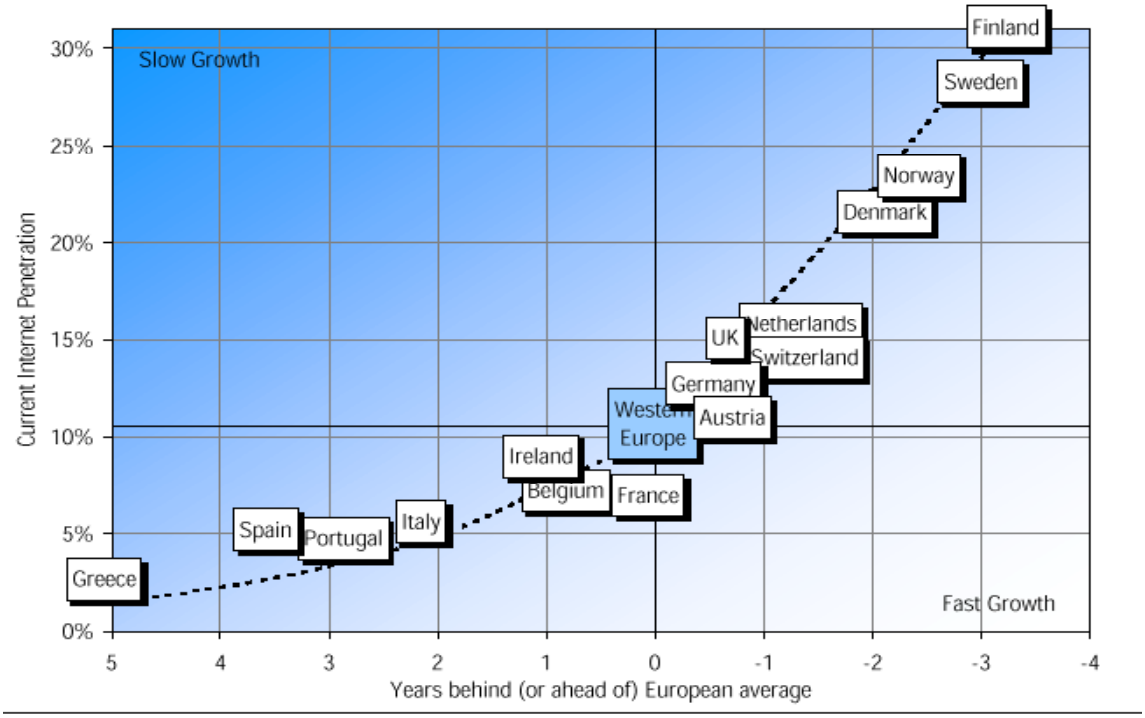
Investment Summary

- **The number of adult Internet users in Europe should increase by almost 200%**, from 34 million in 1998 to 100 million in 2003, according to our new model of European Internet penetration.
- **Digital technology, higher access speeds, 'free' access and better content could drive early European adoption**, at a faster rate than seen in the US.
- **30% penetration rates in Europe are achievable**, in our view — Nordic rates are this high already.
- **We expect dialling up from home to remain the most popular method of connecting with the Internet**, although cable modem and mobile will account for an increasing share of users, on our forecasts. We look for around 4 million broadband users in Europe in 2002.
- **Around 12% of European adults (34 million people) use the Internet**, versus about 32% (64 million) in the US, on consensus estimates for 1998.

For further details, see Appendix I at the back of this report.

Figure 1

Web Users as % of Population



Source: IDC December 1998

A Quick Glance at the What/Wheres of Internet Content and Usage in Europe

Summary

In a quest to determine how people are using the Internet in Europe, we have been very frustrated with the availability of data. In this section we have pulled together available data and have begun to gather our thoughts on European Internet usage patterns.

Some general highlights follow.

- **As of year-end 1998, there were about 34 million European Internet users (9% of population) The highest number of users were in the UK** (8 million users); Germany (7 million users) and France (3 million users).

- **Finland, Norway and Sweden supported the highest rates for Internet usage with 30% respective penetration** Denmark followed with 18% usage penetration. Reasons for high Internet usage penetration in the Nordic countries include relatively high GDPs, liberalized telecom markets and high PC penetration rates (>40%). However, it is notable that these markets are among the smallest in Europe.

- **The most comprehensive content usage data appear to be about the Swedish market** where US-based Media Metrix has just released its first user study. We caution from reading too much into this market data, as, given the relatively low population of Sweden, many of the major global portals (such as Yahoo! and AOL) have not targeted these markets aggressively, yet. That said, the data do offer some important clues about European regional usage patterns. Key findings include:

  1) **19 of the top 35 sites, based on usage, are US-based, while 16 of 35 are Swedish sites**, implying that the American companies have made huge early inroads, while European sites tend to be small, country-specific sites;

  2) **Microsoft's MSN.com was the number one site based on usage**, implying that the operating system link in the slower evolving European markets (as compared to the earlier and more rapidly developed US market) may provide Microsoft with key competitive advantages;

  3) Compaq's AltaVista grabbed the number two spot in part because of its strong search capability. Microsoft's Hotmail free email site nabbed the number three spot and Sweden's home.swipenet.se scored the number four spot thanks to language and cultural uniqueness. Microsoft.com, GeoCities, mirabilis (AOL's ICQ), Tripod, Yahoo!, xoom, preferences.com and Angelfire were the US sites that rounded out the top 20 sites.

- **Based on other surveys, US-based companies appear to have very impressive usage traction** in countries where English is the primary language (UK) and in the largest markets where they have focused (UK and Germany). The US-based leaders are: Yahoo!, America Online and AltaVista.

- **In Europe, as in the US, web portals (such as Yahoo!) dominate usage** as compared to content vertical, commerce and community sites.

- For more specifics on US-based Internet usage trends, see Appendix IX.

European Content Usage Trends

The European Internet market is very fragmented and comprehensive data on country usage is scarce. However, some trends can be drawn from data we have compiled. On 1 June 1999, Media Metrix, a US-based leader in Internet and Digital Media measurement, and SIFO Interactive, the leading media research company in Sweden, released the Top 50 Web sites among users in Sweden At Home and At Work for April 1999 (see Table 1). This survey contains some of the first and most comprehensive Internet audience usage statistics provided outside the United States. The survey found Swedish users are drawn to portals, content providers, community and commerce sites, just like American users (Table 1).

Table 1

Media Metrix: Top 50 Swedish Web Sites (April 1999) (US-based companies in bold)

Rank	Web Sites	Unique Visitors (000s)	Company Descriptions
	Universe (000s)	**3,513**	
1	**msn.com**	**1,487**	***Portal***
2	**altavista.com**	**1,459**	***Portal***
3	**hotmail.com**	**1,347**	***Electronic Mail Service***
4	home.swipnet.se	1,307	*Communications/ISP*
5	aftonbladet.se	1,050	*Vertical Portal - News*
6	algonet.se	938	*Portal*
7	**microsoft.com**	**933**	***Product Reference Site***
8	passagen.se	884	*Portal*
9	**geocities.com**	**861**	***Portal***
10	evreka.com	855	*Portal*
11	**mirabilis.com**	**821**	***Internet Software***
12	torget.se	799	*Portal*
13	telia.se	793	*Communications/ISP*
14	tninet.se	575	*Portal*
15	**members.tripod.com**	**524**	***Portal/Web Hosting Svcs***
16	**yahoo.com**	**482**	***Portal***
17	**xoom.com**	**481**	***Portal***
18	tele2.se	457	*Communications/ISP*
19	**preferences.com**	**454**	***Internet Marketing Svcs***
20	**angelfire.com**	**452**	***Portal/Web Hosting Svcs***
21	**bluemountain.com**	**441**	***e-Commerce***
22	**home.netscape.com**	**421**	***Portal***
23	**real.com**	**374**	***Internet Infrastructure***
24	sunet.se	372	*Vertical Portal - Academics*
25	**se.excite.com**	**370**	***Portal***
26	svt.se	362	*Vertical Portal - Entertainment*
27	dn.se	356	*Vertical Portal - News*
28	tv4.se	348	*Vertical Portal - Entertainment*
29	platsbanken.amv.se	341	*Vertical Portal - Employment Svcs*
30	foreningssparbanken.se	313	*Vertical Portal - Finance/Banking*
31	**msn.se**	**300**	***Portal***
32	**macromedia.com**	**294**	***Internet Software***
33	**aol.com**	**293**	***Portal***
34	**yahoo.se**	**282**	***Portal***
35	rsv.se	282	*Vertical Portal - Government*

The top 50 Web sites are based on unduplicated audience reach, also known as unique visitors. Top sites are from SIFO Interactive's At Home and At Work Internet audience ratings in Sweden.

Unique Visitors: The actual number of total users who visited the Web site once in the given month. All Unique Visitors are unduplicated (only counted once) and are in thousands. *Source: Media Matrix/SIFO Interactive*

Spotlight on Sweden

On 1 June 1999, Media Metrix, a leading US Internet audience measurement service, and SIFO Interactive, Sweden's leading media research company, announced the results of their first survey of Swedish Web surfing habits. We caution from reading too much into this market data, as, given the relatively low population of Sweden, many of the major global portals (such as Yahoo! and AOL) have not targeted these markets aggressively, yet. That said, the data do offer some important clues about European regional usage patterns. This is the first survey Media Metrix has conducted outside of the US on web usage patterns.

The key findings of the report follow.

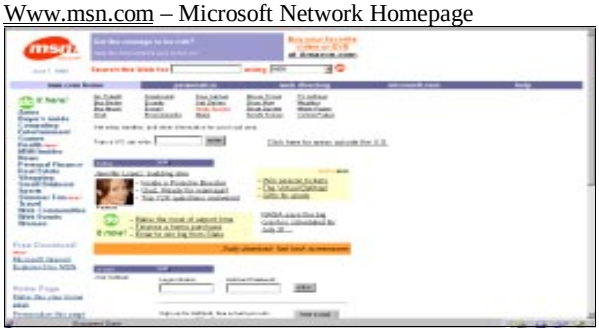
- **Swedish Internet users appear to have similar habits to their US counterparts** with content, community, communications, and commerce Web sites supporting high usage in both countries.
- **More specifically, Swedish Web surfers appear to use many of the same sites as US Internet users** The top three Web domains in April in Sweden (based on unique visitors) were msn.com, altavista.com, and hotmail.com, which were also, respectively, the 3rd, 14th, and 12th most visited domains in the US in that month, according to Media Metrix. Also, of the top 50 Swedish Web sites, 24 were US Web sites or Swedish versions of those sites (e.g. yahoo.se or Yahoo! Sverige). Interestingly, the Yahoo! and Microsoft Network home pages each drew more Swedish visitors than the Swedish versions of those sites.
- **Swedish Internet users also appear to rely on some local content and community sites** Among the top ten leading Swedish Web sites are Home.Swipnet.se (an Internet Service Provider), Aftonbladet.com (a Swedish news site), Algonet.se (a community site), and Passengen.se and Evreka.com (community sites/search engines).
- **The Internet has a nearly 50% penetration rate in Sweden** (one of the highest rates in the world), with approximately 3.5 million users per month. And nearly all age groups are equally represented among Swedish Internet users.

  Over the next three pages, we highlight the leading Web sites used in the Swedish market.

msn.com *Portal*

Microsoft is the worldwide leader in software for personal computers. The company offers a wide range of products and services for business and personal use, each designed with the mission of making it easier and more enjoyable for people to take advantage of the full power of personal computing every day. On the Internet, Microsoft has created a series of successful brand names: Expedia travel service, CarPoint automotive service, Hotmail, Microsoft Investor, Gaming Zone, and Microsoft Money Central. The company's strategy going forward is to unify these sites around the MSN brand, so customers can easily reach all of them via a single portal, msn.com. Microsoft's strategy is to combine these brands with their packaged-software products, among them Microsoft Money, Encarta, and games such as Flight Simulator, to break down the barriers between online and offline products and services.

Www.msn.com – Microsoft Network Homepage



shopping.msn.com – Microsoft Network Shopping

altavista.com *Portal*

AltaVista, a wholly owned subsidiary of Compaq Computer, provides specialty search features for the Internet. AltaVista provides search capabilities by category, including business & finance, health & fitness, media & amusements, etc. The searches can be customized to find images using AV Photo and Media Finder or to exclude objectionable material using Family Filter capabilities. Other recent innovations include phrase detection, spell check, and natural language capabilities. On April 5, 1999, AltaVista announced the completion of the acquisition of Zip2, a leader in developing, hosting, and maintaining consumer Web sites for media companies. With a wide selection of content and services, AltaVista attracts a wide audience as one of the leading portals on the Web.

www.altavista.com – AltaVista Homepage

abcnews.go.com/altavista – AltaVista ABC News Venture

hotmail.com

Communications

Hotmail is Microsoft's free online e-mail service, offering its users the opportunity to check their e-mail anywhere in the world on the Internet.

www.hotmail.com – Hotmail Homepage

www.hotmail.com – Hotmail Email Safety

home.swipnet.se

Communications

Tele2 is a Swedish communications company that provides services ranging from Internet to cellular telecommunications. The site is in Swedish.

home.swipnet.se – Tele2 Homepage

www.tele2.se/info – Tele2 Information Page

aftonbladet.se

Vertical Portal - News

Aftonbladet is a Swedish news portal. The site looks like a newspaper on the Internet, offering current news and an archive of old news.

www.aftonbladet.com – Aftonbladet Homepage

www.aftonbladet.se/sport – Aftonbladet Sports Page

algonet.se

ISP/Portal

Algonet is a Swedish ISP/portal offered by Telenordia. The site offers e-mail and other services to its users.

www.algonet.com – Telenordia Internet Page

start.telenordia.se/innehall – Telenordia Innehall

Spotlight on European Usage

UK leads in Internet usage The United Kingdom is the largest market based on the number of Internet users (8.1 million), followed by Germany (7.1 million), France (2.8 million) and Sweden (2.6 million) (see Table 2). Cheap Internet access and proficiency in English spurred user growth in these countries. Countries with lower average GDP, PC penetration rates, and/or higher Internet access rates (Greece, Portugal and Ireland) had the lowest penetration rates.

Nordic countries lead in Internet penetration The Nordic countries of Finland, Norway and Sweden are the leaders in penetration rates at 31%, 31% and 29%, respectively. At these levels, the Nordic countries are inline with the U.S. penetration rate near 34%. Relatively high GDPs, liberalized telecom markets and high PC penetration rates (>40%) have helped these countries to have high penetration rates (see Table 3).

Some Early First Pass Usage Statistics from Leading Countries Indicate that US Leaders Have Momentum

The top European web sites by country (see Table 4) consist of portals, content providers, community and commerce sites. In France, the top web site is Wanadoo.com, an ISP/Communications site run by France Telecom. The second and third top web sites (according to a recent brand awareness study) are AOL.fr and Yahoo!.fr, two American based-sites which are translated into French and localized for content. Note that three of these sites also offer access. In Germany, the leading web sites (based on reach studies) are Yahoo!, Alta Vista, Netscape and WEB.DE.

US web sites dominate in countries with high English fluency where localization costs are minimal and market size is large. In the UK, the leading web sites are Yahoo!, AltaVista and Infoseek. In countries with smaller markets, initial localization costs may deter companies who prefer to lock in larger markets before targeting smaller ones. In countries with smaller non-English user bases, the need for Internet support has fueled the growth of local portals and content providers. Competition among Internet Service Providers has made Internet access cheap, increasing usage rates.

Table 2

Internet Penetration in Europe, 1998 (Ranked by Number of Users)

	Internet Users (M)	Total Population (M)	Proportion of Population[1] Using Internet (%)
UK	8.1	58.1	13.9
Germany	7.1	82.1	8.7
France	2.8	58.6	4.8
Sweden	2.6	8.8	29.3
Italy	2.1	57.6	3.7
Spain	2.0	39.3	5.0
Netherlands	2.0	15.3	12.8
Finland	1.6	5.1	30.8
Norway	1.3	4.4	30.5
Switzerland	1.0	7.1	14.1
Denmark	1.0	5.3	18.0
Belgium	0.8	10.2	7.7
Austria	0.5	8.1	6.7
Ireland	0.3	3.7	7.1
Portugal	0.3	10.0	2.6
Greece	0.2	10.5	2.3
Europe	**33.6**	**384.2**	**8.8**

1. Based on the total population, including children

Source: Computer Industry Almanac

Table 3

Internet Penetration in Europe, 1998 (Ranked by Penetration Rates)

	Internet Users (M)	Total Population (M)	Proportion of Population[1] Using Internet (%)
Finland	1.6	5.1	30.8
Norway	1.3	4.4	30.5
Sweden	2.6	8.8	29.3
Denmark	1.0	5.3	18.0
Switzerland	1.0	7.1	14.1
UK	8.1	58.1	13.9
Netherlands	2.0	15.3	12.8
Germany	7.1	82.1	8.7
Belgium	0.8	10.2	7.7
Ireland	0.3	3.7	7.1
Austria	0.5	8.1	6.7
Spain	2.0	39.3	5.0
France	2.8	58.6	4.8
Italy	2.1	57.6	3.7
Portugal	0.3	10.0	2.6
Greece	0.2	10.5	2.3
Europe	**33.6**	**384.2**	**8.8**

1. Based on the total population, including children

Note: Media Metrix conducted a survey in March 1999 which found Sweden to have a 50% penetration rate and 3.5 million users on average per month.

Drilling Down on European Internet Demographics

According to an internetTrak survey commissioned by Ziff-Davis, Yahoo!, and Dell in the third quarter of 1998, Yahoo! is the leading search/directory used in Europe.

The internetTrak survey also drew several broader findings about European Internet usage.

The UK has been experiencing Internet growth rates comparable to growth rates in the US At 15% adult Internet penetration rate, the UK is approximately at the same level as the US was two years ago and experiencing similar growth rates. In the six months prior to November 1998, more than one million adults in the UK began using the Internet, bringing the total number of UK Web users to 8 million. Of those surveyed, 1.8 million people said they were very likely to use the Internet over the next six months.

- **The UK has higher Internet penetration rates than Germany and France** The UK has an adult Web penetration rate of 15%, while Germany and France follow with 10% and 8%, respectively. These rates trail far behind the US adult penetration rate of 37%. Germany has the highest percent of users visiting the Web at least once a week at 69% compared to 54% of Web users in France, and 77% of American Web users. The average age of Web users in the UK (37), France (32) and Germany (33) is similar to the average age in the US (37).

Table 4

European Analysis of Reach by Country

Europe	Source	Criteria	Top 5 Sites	Results
France	Mediametrics Q1:99	Aided Awareness Study	1 Wanadoo.fr	71.9%
			2 AOL.fr	59.1%
			3 Yahoo.fr	54.5%
			4 Club-internet.fr	53.6%
			5 Cplus.fr	49.1%
Germany	Gfk Online Monitor Feb 99	Reach	1 Yahoo!	47.9%
			2 AltaVista	29.7%
			3 Netscape - Guide	19.7%
			4 WEB.DE	23.7%
			5 Lycos	20.4%
		Most Often Used	1 Yahoo!	28.0%
			2 AltaVista	9.0%
			3 AOL Netfind	6.9%
			4 Fireball	6.9%
			5 WEB.DE	6.6%
Norway	Gallup User Survey 9/98	Unique users/week	1 SOL	379
			2 VG	299
			3 Yahoo.no	288
			4 Nettavisen	252
			5 Dagbladet	241
Sweden	Relevant Knowledge 7/98	Unique users/month	1 Passagen	955
			2 Tele2	928
			3 Telenordia	792
			4 Telia	746
			5 AltaVista Sverige	665

- **Eighty-eight percent of users surveyed expressed high levels of satisfaction** with the overall quality of the Web, while 86% were satisfied with ease of access and availability of information. Of interest, only forty-seven percent of users were satisfied with the speed with they could download information, indicating **potentially strong demand for broadband applications**

- **Europeans are turning to the Internet for a variety of applications** According to the internetTrak survey, 86% of users research topics or issues on the Web; 77% obtain information about products/services; 62% download software; 50% receive news updates; 39% plan personal/business travel; 38% chat with people; 37% listen to/sample music; 33% look at TV/cinema listings; 30% receive weather updates or watch video footage; and 27% play games. In addition, 25% of users access the Web to purchase products or services; 22% to visit adult entertainment sites; 19% track stock, bond or mutual fund prices; 8% use Internet telephony (a surprisingly high percentage); 6% conduct banking; and 2% use an Internet-based dating service.

- **Search engines are major drivers of traffic** According to the survey, 74% of users rely on search engines to locate Web sites, while 68% find new Web sites through word of mouth, and 65% from links from other sites. The top search engines used were Yahoo! (90%); AltaVista (61%); and Infoseek, Excite and Lycos each with approximately 42% of users.

- **Women are accessing the Internet at an increasing rate** Two years ago, only 14% of Internet users in the UK were women, compared to 40% of the users at the time of the survey. In addition, 1.8 million women representing 57% of respondents plan to use the Web in the next six months.

- **Internet usage in Europe appears to be fairly frequent** 28% of users access the Internet at least once a week, followed by 21% who access the Internet less than once a week, and 20% who access the web every day. Sixteen percent of users claimed to have not used the Internet over the past three months, whereas 14% said they used the Internet several times a day. However, Web usage in Europe should grow, since 38% of the surveyed users thought they would be spending more time on the Internet, compared to 9% who thought they would be spending less time.

- **E-commerce is experiencing strong growth in Europe** 1.6 million Internet users bought a product or service over the Web in the three months leading up to the survey, while 2.9 million expect to spend more in the next year. Many users gather information on the Web and then make purchases on or off line. Of the purchases made online: 43% are software; 37% are PCs/related products; 23% are books; and 17% are music CDs; and 11% are games.

- **Internet usage in the UK appears to have caused some displacement of traditional media** TV usage has decreased 11% while computer magazine usage has increased 9%. Sixty percent of users agreed that web usage has increased their interest in information about computers and related products.

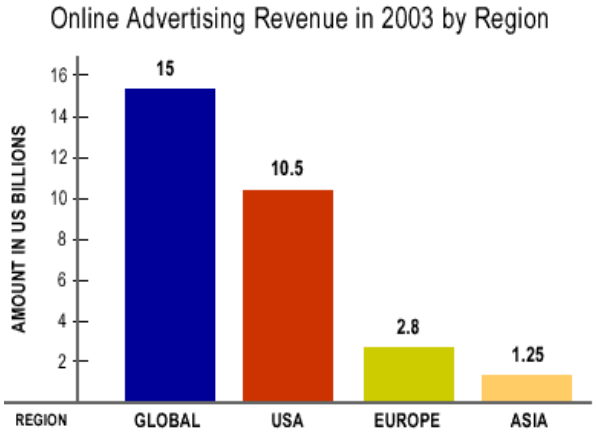
Table 5

Web Usage

	UK	France	Germany	US
(% of Adult Population)				
Ever accessed web	15	8	10	37
Visited the Web in past 3 months	13	6	9	30
(% of Web Users)				
Visit the web at least once a week	66	54	69	77
Women	25	27	22	48
Average Age	37	32	33	37

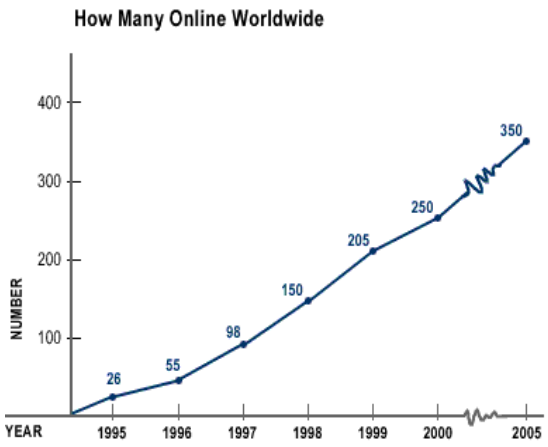
Source: InternetTrak Survey

Figure 2



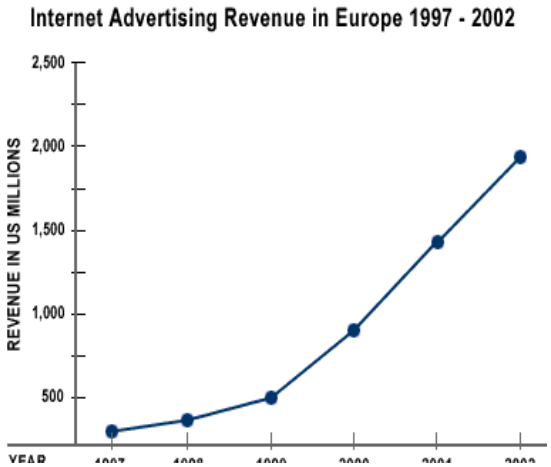
Source: Datamonitor

Figure 3



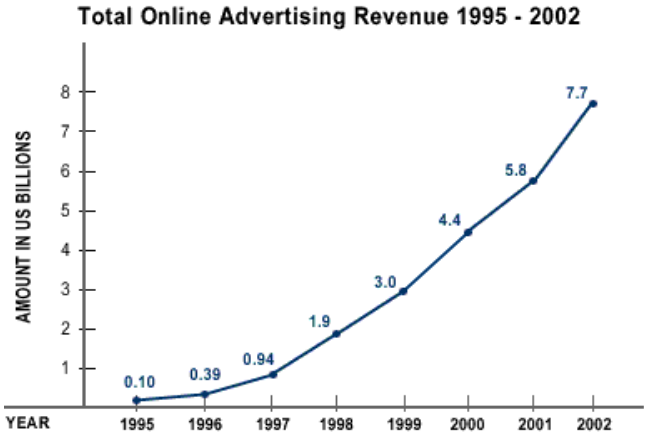
Source: InternetTrak Survey

Figure 4



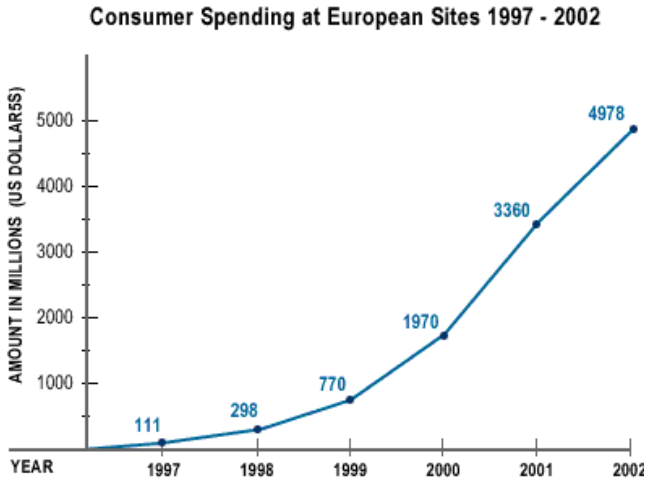
Source: Datamonitor

Figure 5



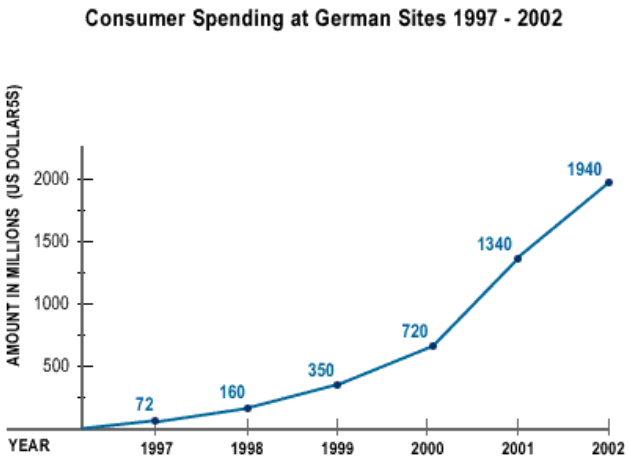
Source: Jupiter Communications

Figure 6



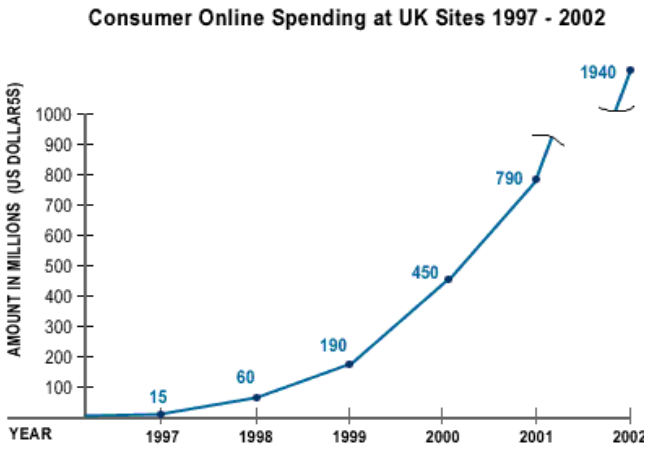
Source: Datamonitor

Figure 7



Source: Datamonitor

Figure 8



Source: Datamonitor

Chapter 2

Internet Structure

European Internet Infrastructure

Steve Winram/Michael Steib

Investment Summary

- **Telecoms operators, alternative network operators and other Internet Service Providers (ISPs) own and manage the Internet** infrastructure in Europe.
- **We estimate there are over 2,000 ISPs in Europe**, including international backbone ISPs, national ISPs and regional and consumer ISPs.
- **European ISP revenues are forecast to grow at a CAGR of 30% to 2004**, when they could reach $22 billion.
- **Backbone services revenues could more than triple to $6.1 billion in 2002**, compared with $2.0 billion in 1998, according to Datamonitor.
- **European backbone infrastructure is under-developed at present** A group of new network operators (alternative network operators, to distinguish them from the PTTs) are rapidly building new high-speed/broadband capacity. This group, together with the PTTs, stands to be a major beneficiary of growth in data and Internet traffic.
- **Competition to supply corporate Internet users is well developed,** but access to the consumer, via the local loop, is still dominated by the PTTs.

For further details see Appendix II-a.

Chapter 3

Internet Structure

Access Providers and Portals

Steve Winram/Michael Steib

Investment Summary

- **Internet service provision is commoditising quickly at the consumer access level** Access providers to corporations can add value through managed network services: e.g., web-hosting, virtual private networks and transaction software.
- **We expect consolidation to identify the likely winners** over the next 18 months out of the 2,000-plus ISPs currently operating in Europe.
- **Four groups should eventually dominate the European Internet Service Provider market:** telecom companies, cable companies, European media groups and 'non-typical' players, such as Dixons. As the Internet becomes more mature, we should also see a number of successful start-up companies.
- **Dixons' Freeserve and other free ISPs have shown that one revenue stream (subscriptions) can be sacrificed** in order to achieve much larger revenue streams from advertising and commerce.
- **Successful ISPs will own a combination of compelling content and a high number of subscribers/customers** in order to capitalise on other sources of revenue.
- **The most successful access service models will combine revenues** from telecoms, subscriptions, advertising and transactions, in our view.
- **The winners in this sector should emerge from five groups:** the PTTs, cable companies, media groups, non-typical Internet companies and US content and aggregation companies.

For further details see Appendix II-b.

Chapter 4

Internet Structure

Internet Access Technologies in Europe

Steve Winram/Michael Steib

Investment Summary

- **Access technologies will be a key driver of Internet penetration**, improving the access to and functionality of the medium.
- **Dial-up remains the most widely-used narrowband technology**, most typically by individuals and small businesses.
- **xDSL technology is being perceived increasingly as a good compromise** between the slow speed of dial-up services and the high cost of cable network upgrade.
- **Cable modems provide access to the Internet up to 1,000 times faster than dial-up services** Also, the customer saves telephone usage charges, so cable access may also be cheaper for frequent users.
- **Mobile access is one area where the market could develop more rapidly in Europe** than in the US, as Europe's cellular operators have adopted the pan-European GSM for cellular digital communications.
- **Internet access is likely to see significant changes over the next 2-3 years** as broadband technologies are rolled out to the mass market, creating opportunities for entertainment and information-rich media and commerce.

For further details see Appendix II-c.

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